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EXAMINER

LYONS, MICHAEL A

ART UNIT

PAPER NUMBER

2877

NOTIFICATION DATE

DELIVERY MODE

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ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@bgllp.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/060,983	<b>Applicant(s)</b> DUBOIS ET AL.	
	<b>Examiner</b> MICHAEL A. LYONS	<b>Art Unit</b> 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-78 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-16 and 52-54 is/are allowed.
- 6) ☒ Claim(s) 1-13, 17-25, 29-51, 55-63 and 67-78 is/are rejected.
- 7) ☒ Claim(s) 26-28 and 64-66 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

Claim 1 is objected to because of the following informalities: line 5 of the claim reads "a two wave mixing interferometer measures the ultrasonic signal"; it should read "a two wave mixing interferometer that measures the ultrasonic signal". Additionally, line 10 is missing the word "and" to properly tie together the last two elements of the claimed system. Appropriate correction is required.

Claim 10 is objected to because of the following informalities: line 7 of the claim misspells "controlling" as "co trolling". Further, line 10 of the claim should read "the at least one wave characteristic controlling circuitry is operable to adjust". Appropriate correction is required.

Claim 35 is objected to because of the following informalities: line 11 of the claim should read "the at least one processor" rather than "the as at least one processor" as currently claimed. Appropriate correction is required.

Claim 75 is objected to because of the following informalities: line 8 of the claim should read "at least one beam" rather than "at least on beam"; line 13 of the claim should read "communicatively coupled to the at least one processor" rather than "communicatively coupled the at least one processor"; the claim must also end with a period. Appropriate correction is required.

As for any claim not explicitly mentioned here, the examiner requests applicant's assistance in making sure all claims are grammatically correct.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 17-19, 28 and 35-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claim 17 recites the limitation "the frequency shifting device" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. What frequency shifting device is being referred to here?

Claims 18-19 are also rejected as being dependent from at least claim 17 and thereby containing all the limitations of the claim on which they depend.

Claim 28 recites the limitation "the synthetic signal generator" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. There is no antecedent basis in claim 23 for this limitation.

Claim 35 recites the limitation "the frequency controlling system" in lines 6-7 and "the at least one frequency shifting device" in lines 13-14. There is insufficient antecedent basis for this limitation in the claim. What frequency controlling system is being referred to here? What frequency shifting device is being referred to here?

Claims 36-39 are also rejected as being dependent from at least claim 35 and thereby containing all the limitations of the claim on which they depend.

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For purposes of examination, the examiner will treat any reference to “frequency controlling” and “frequency shifting” as being tied to a wave characteristic controlling system and adjusting device as is consistent with the rest of the claimed invention.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claims 75-78 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

Based on the Supreme Court precedent, a definitive test to determine whether a process claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to preempt the principle itself was enunciated. A claimed process is statutory under 35 U.S.C. § 101 if: it is tied to a particular machine or apparatus, or it transforms a particular article into a different state or thing. See *In re Bilski*, 545 F.3d 943, 88 USPQ 2d 1385.

Claim 75 fails the above test. Claim 75 determines a desired wave characteristic of at least one beam of coherent electromagnetic energy with at least one processor, compensates for any wave distortion produced by scanning with the beam of coherent electromagnetic energy, and directing at least one wave characteristic adjusting device with at least one wave characteristic controlling circuitry communicatively coupled to the at least one processor. This claim is neither tied to a particular machine or apparatus, nor does it transform a particular article into a different state or thing, as all the claim finally does is directing at least one wave characteristic adjusting device with at least one wave characteristic controlling circuitry.

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Although this final positively recited step in the claim is the directing of a wave characteristic adjusting device, this is an insignificant post solution activity that fails to render the claim statutory in light of the *Bilski* decision, as the claim is silent as to what the direction actually accomplishes.

Claims 76-78 are also rejected for the same reasons; none of these claims are tied to a particular machine or apparatus, nor do they transform a particular article into a different state or thing.

The examiner notes that while the preamble of the claims discuss adjusting a wave characteristic of at least one beam of coherent energy that is used in a two-wave mixing interferometer. However, none of the adjusting steps are positively recited within the claims; none of the positively recited steps in each method claim are tied to a particular machine or apparatus as a result. This is in view of *Kropa v. Robie* (88 USPQ 478 (CCPA 1951)), which states that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description not depending for completeness upon the introductory clause

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-13, 23-25, 40-51, 55, 57, and 61-63 are rejected under 35 U.S.C. 102(b) as being anticipated by Monchalin et al (5,131,748).**

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Regarding claims 1 and 40, Monchalin (Fig. 1) discloses a system and corresponding method for testing a physical attribute of a manufactured object, the system and method comprising a laser ultrasound generation system (ULTRASOUND) to generate an ultrasonic signal within the manufactured object 16 with at least one laser pulse (see Col. 4, line 65); a two wave mixing interferometer that measures the ultrasonic signal by means of a probe beam 10a of coherent electromagnetic energy from laser source 12 and a pump beam 10b of coherent magnetic energy, wherein the probe beam of coherent electromagnetic energy scans across the manufactured object, wherein scanning the probe beam alters a wave characteristic of the two wave mixing interferometer, and is scattered or reflected by the manufactured object (see Col. 4, line 66 – Col. 5, line 3); and at least one wave characteristic adjusting device 24 coupled to the two-wave mixing interferometer that compensates for the altered wave characteristics caused by the scanning motion of the probe beam of the two wave mixing interferometer (see Col. 5, lines 6-53).

As for claims 2 and 41, Monchalin discloses device 24 to be located in the path of pump beam 10b.

As for claims 3 and 42, Monchalin, in an additional embodiment (Fig. 2) that discloses all the claimed limitations of claims 1 and 40 above, discloses device 54 that acts as a wave characteristic adjusting device that is situated in the path of the probe beam.

As for claims 4 and 43, Monchalin discloses voltage source 26 to control device 24, and power oscillator 56 to control device 54.

Regarding claims 5 and 44, Monchalin (Fig. 1) discloses a system and corresponding method for measuring a physical attribute of a manufactured object, the system and method

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comprising a sonic energy signal generator (ULTRASOUND), the sonic energy signal generator initiating at least one sonic energy signal associated with the manufactured object (see Col. 4, lines 61-66); a two-wave mixing interferometer, the two-wave mixing interferometer having a pump beam 10b of coherent electromagnetic energy from laser source 12 and a probe beam 10a of coherent electromagnetic energy, the probe beam of coherent electromagnetic energy being scanned across the manufactured object 16, the probe beam reflecting from the object with an altered wave characteristic caused by the scanning motion of the probe beam (see Col. 4, line 66 – Col. 5, line 3); and at least one wave characteristic adjusting device 24 coupled to the two-wave mixing interferometer, the at least one wave characteristic adjusting device adjusting a wave characteristic of at least one beam of coherent electromagnetic energy, the wave characteristic adjusting device compensating for the altered wave characteristic caused by the scanning motion of the probe beam of the two-wave mixing interferometer (see Col. 5, lines 6-53).

As for claims 6 and 45, Monchalin, in an additional embodiment (Fig. 2) that discloses all the claimed limitations of claims 5 and 45 above, discloses device 54 that acts as a wave characteristic adjusting device that is situated in the path of the probe beam.

As for claims 7 and 46, Monchalin discloses device 24 to be located in the path of pump beam 10b.

As for claims 8 and 47, Monchalin discloses voltage source 26 to control device 24, and power oscillator 56 to control device 54.

As for claim 9, Monchalin discloses beam 10b to be the pump beam and beam 10a to be the probe beam of the two-wave mixing interferometer.



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Regarding claims 10 and 48, Monchalin (Fig. 1) discloses a two-wave mixing interferometer and corresponding method comprising at least one coherent electromagnetic energy generator 12, the at least one coherent electromagnetic energy generator generating at least one beam 10 of coherent electromagnetic energy; at least one wave characteristic controlling circuitry 24, the at least one wave characteristic controlling circuitry communicatively coupled to the at least one coherent electromagnetic energy generator (this occurs by being in the beam path of pump beam 10b), wherein the at least one wave characteristic controlling circuitry is operable to adjust the wave characteristic of the at least one beam of coherent electromagnetic energy to compensate for the wave characteristic distortion caused by a scanning motion of the probe beam of the two-wave mixing interferometer (see Col. 5, lines 6-53).

As for claims 11 and 49, Monchalin, in an additional embodiment (Fig. 2) that discloses all the claimed limitations of claims 10 and 48 above, discloses device 54 that acts as a wave characteristic adjusting device that is situated in the path of the probe beam.

As for claims 12 and 50, Monchalin discloses device 24 to be located in the path of pump beam 10b.

As for claims 13 and 51, Monchalin discloses voltage source 26 to control device 24, and power oscillator 56 to control device 54.

Regarding claims 23 and 61, Monchalin (Fig. 1) discloses a system and corresponding method for detecting a sonic energy signal associated with a manufactured object, the system and method comprising a probe beam 10a of coherent electromagnetic energy from laser source 12; a pump beam 10b of coherent electromagnetic energy; the probe beam being scanned across a

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surface of the manufactured object 16, wherein the probe beam is distorted by scanning; the probe beam reflecting from the manufactured object with an altered wave characteristic indicative of a scanning motion of the probe beam (see Col. 4, line 66 – Col. 5, line 3); the probe beam being directed to a two-wave mixing interferometer; the pump beam passing through a wave characteristic adjusting device 24, the wave characteristic adjusting device communicatively coupled to a wave characteristic controlling system 26; the wave characteristic adjusting device operable to adjust a wave characteristic of the pump beam in order to compensate for distortion caused by scanning of the probe beam, with both the probe beam and the pump being directed to the two-wave mixing interferometer, and the wave characteristic controlling system operable to direct the wave characteristic adjusting device to adjust the wave characteristic of the pump beam (see Col. 5, lines 6-53).

As for claims 24 and 62, Figure 4 of Monchalin, in addition to showing all the key features as set forth in claims 23 and 61, shows a wave characteristic adjusting device being controlled by feedback from the two-wave mixing interferometer.

As for claims 25 and 63, Monchalin discloses that the wave characteristic controlling system 26 adjusts the wave characteristic adjusting device 24, thereby adjusting a parameter of the two-wave mixing interferometer.

Regarding claim 55, Monchalin (Fig. 1) discloses a method for adjusting a wave characteristic of a beam of electromagnetic energy comprising adjusting a wave characteristic of the beam 10b of coherent electromagnetic energy by a specific amount in a specific direction with at least one electro-optic phase modulator 24 situated in a path of the beam of coherent electromagnetic energy, the wave characteristic adjustable to compensate for a wave

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characteristic distortion caused by a scanning motion of a probe beam 10a of a two-wave mixing interferometer (see Col. 5, lines 6-53).

As for claim 57, Monchalin discloses device 24 to be located in the path of pump beam 10b.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 20-22, 29-39, 56, 58-60, and 67-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Monchalin et al (5,131,748).**

Regarding claims 20 and 58, Monchalin (Fig. 1) discloses a wave characteristic adjusting device and corresponding method comprising an electro-optic phase modulator 24; the modulator situated such that the beam of coherent electromagnetic energy 10b passes through it; and the modulator being operable to adjust the wave characteristic of the beam of coherent

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energy by amounts and in directions selectively determined, the wave characteristic of the beam being adjusted to compensate for a wave characteristic distortion caused by a scanning motion of a probe beam 10a of the two-wave mixing interferometer (see Col. 5, lines 6-53).

Monchalin, however, fails to disclose a plurality of phase modulators.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a plurality of electro-optic phase modulators to the device of Monchalin, the motivation being that it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. This holds particularly true due to the limitations of the claim, as only one electro-optic phase modulator is used at any given time for wave adjusting; a plurality of modulators can be added to Monchalin without changing the functionality of the device.

As for claims 21, 56, and 59, Monchalin, in an additional embodiment (Fig. 2) that discloses all the claimed limitations of claims 10 and 48 above, discloses device 54 that acts as a wave characteristic adjusting device that is situated in the path of the probe beam. Device 54, however, is not an electro-optic phase shifter.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to rearrange the parts of Monchalin so that the electro-optic phase shifter of Figure 1 is in the probe beam path of the interferometer, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

As for claims 22 and 60, Monchalin discloses device 24 to be located in the path of pump beam 10b.

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As for claims 29-34, 67-71, and 73, Monchalin discloses the claimed invention as set forth above regarding claims 23 and 61 above, but fails to disclose the use of a database (claims 29 and 67) containing information about the manufactured object (claim 30 and 68) or information obtained from a previous detection (claims 31 and 69) that is used to control the wave characteristic adjusting device. Monchalin further fails to disclose having a representation of the object (claims 32 and 70) that is either generated by computer-aided-drafting (claims 33 and 71) or comes from a stand alone, standard shape measurement device (claims 34 and 73), whereby information from the representation of the shape of the object is used to control the wave characteristic adjusting device.

However, in Figure 4 of Monchalin, there is a feedback loop disclosed where information gleaned from measurements taken by the device are used to control a wave characteristic adjusting device situated in the pump beam path of the interferometer. Furthermore, Official Notice is taken as to the well known use of databases and libraries of previously obtained or standard information for comparison with instantly measured data by an optical measurement device.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a database for control of the wave characteristic adjusting device of Monchalin, the motivation being that the use of information from a database containing either stored information about the object or instantly obtained information about the object undergoing ultrasonic distortion to control the wave characteristic adjusting device would lead to more accurate measurements being achieved by the use of the Monchalin device.

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As for claims 72 and 74, Figure 4 of Monchalin shows a wave characteristic adjusting device being controlled by feedback from the two-wave mixing interferometer.

Regarding claims 35-39 and 75-78, Monchalin (Fig. 4) discloses a wave characteristic adjusting device and corresponding method comprising a differential amplifier 128 and wave characteristic controlling circuitry represented by stabilization networks 136 and 138, the differential amplifier determining a desired wave characteristic as a result of the measurement of surface transient motion of surface 16, and the at least one wave characteristic controlling circuitry being operable to direct the at least one wave characteristic adjusting device 130 and configured to compensate for a wave characteristic distorted by scanning with a beam of coherent electromagnetic energy (see Col. 8, line 56 – Col. 9, line 38).

Monchalin fails to disclose the use of a processor, along with various further limitations such as programmable circuitry (claims 36 and 76), a readable memory device (claims 37 and 77), a database (claims 38 and 78) on the readable memory device, and a representation of the object (claim 39) on the readable memory device.

Official Notice is taken, however, as to the well known use of processors for performing data processing in optical measuring devices. Furthermore, as discussed above regarding claims 29-34, 67-71, and 73, Official Notice is taken as to the well known use of databases and libraries of previously obtained or standard information for comparison with instantly measured data by an optical measurement device. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a processor for the differential amplifier of Monchalin, the motivation being that the processor and differential amplifier are functionally equivalent; they both would be capable of processing signals from detectors 124 and

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126 and providing the necessary output to networks 136 and 138 to provide stabilization to the Monchalin device without any changes in functionality.

*Allowable Subject Matter*

**Claims 14-16 and 52-54 are allowed in view of the prior art.**

**Claims 26-28 and 64-66 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

The following is a statement of reasons for the indication of allowable subject matter:

As to claims 14 and 52, the prior art of record, taken either alone or in combination, fails to disclose or render obvious a wave characteristic adjusting device and corresponding method, the device and method comprising, among other essential features, an electro-optic polarizer, a polarized beam deflector, a first electro-optic phase modulator, and a second electro-optic phase modulator, along with their particular arrangement and corresponding function, in combination with the rest of the limitations of the above claims.

As to claims 26 and 64, the prior art of record, taken either alone or in combination, fails to disclose or render obvious the further limitation of claims 23 (claim 26) and 61 (claim 64), where the system further comprises a synthetic signal generator, the synthetic signal generator being situated in a path of the probe beam of coherent electromagnetic energy, and the generator adding a synthetic coherent electromagnetic energy signal to the probe beam of coherent electromagnetic energy, in combination with the rest of the limitations of the above claims.

**Claims 17-19 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 14-16.** When two claims in an application are duplicates or else are so close in content

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that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim.

See MPEP § 706.03(k).

***Response to Arguments***

Applicant's arguments with respect to all claims currently rejected above have been considered but are moot in view of the new ground(s) of rejection.

However, the examiner wishes to note that 37 CFR 1.111 (c) requires applicant to "clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed in the references cited or the objections made. He or she must also show how the amendments avoid such references or objections." Merely stating that the references do not teach claimed limitations fails to meet this requirement.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL A. LYONS whose telephone number is (571)272-2420. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael A. Lyons/  
Primary Examiner, Art Unit 2877  
July 11, 2009